

Application No. 11/720,607
Attorney Docket No. 2003B126

Amendment to the Claims

This Listing of Claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 -12 (cancelled)

Claim 13 (currently amended): A catalyst composition consisting of comprising:

- (a) a support;
- (b) a ~~first metal~~ rhodium component ~~comprising rhodium;~~
- (c) a ~~second metal~~ an indium component ~~comprising indium;~~ and optionally
- (d) a third metal component wherein the metal in said third metal component is selected from the group consisting of iron, cobalt, and ruthenium comprising a metal different from those of said first and second components and selected from Groups 1 to 15 of the Periodic Table of Elements,

wherein ~~at least~~ said first and second metal components and said third metal component, if present, are predominantly contained in an outer surface layer of the support having a depth of not more than 300 microns.

Claim 14 -15 (Cancelled)

Claim 16 (Original): The catalyst composition of claim 13 wherein the depth of said outer surface layer of the support is not more than 100 microns.

Claim 17 (cancelled)

Claim 18 (currently amended): The catalyst composition of claim 13, wherein rhodium is present in the amount of and comprising from about 0.01% to about 10% ~~of rhodium~~ by weight of the total catalyst composition including the support.

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Claim 19 (currently amended): The catalyst composition of claim 13, wherein rhodium is present in the amount of and comprising from about 0.04% to about 5% ~~of rhodium~~ by weight of the total catalyst composition including the support.

Claim 20 (currently amended): The catalyst composition of claim 13, wherein indium is present in the amount of and comprising from about 0.01 wt% to about 30 wt% indium by weight of the total catalyst composition including the support.

Claim 21 (currently amended): The catalyst composition of claim 13, wherein indium is present in the amount of and comprising from about 0.04 wt% to about 20 wt% indium by weight of the total catalyst composition including the support.

Claim 22-24 (Cancelled)

Claim 25 (currently amended): The catalyst composition of claim 13, wherein rhodium is present in the amount of and comprising from about 0.04% to about 10% ~~of indium~~ by weight of the total catalyst composition including the support.

Claim 26 (currently amended): The catalyst composition of claim 13, wherein the metal in said third metal component is present in the amount of and comprising from about 0.01% to about 50% ~~of the metal of the third metal component~~ by weight of the total catalyst composition including the support.

Claim 27 (currently amended): The catalyst composition of claim 13, wherein the metal in said third metal component is present in the amount of and comprising from about 0.05% to about 30% ~~of the metal of the third metal component~~ by weight of the total catalyst composition including the support.

Claim 28 (Cancelled)

Claim 29 (Cancelled)

Claim 30 (currently amended): The catalyst composition of claim 13 ~~claim 29~~ wherein the metal in said third metal component is iron present in the amount of and comprising

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~~composition comprises~~ from about 0.05% to about 30% ~~of iron~~ by weight of the total catalyst composition including the support.

Claim 31 (currently amended): The catalyst composition of claim 13 ~~claim 29~~ wherein the metal in said third metal component is iron present in the amount of ~~and the catalyst composition comprises~~ from about 0.1% to about 20% ~~of iron~~ by weight of the total catalyst composition including the support.

Claim 32 (currently amended): The catalyst composition of claim 13 ~~claim 29~~ wherein the metal in said third metal component is cobalt present in the amount of ~~and the catalyst composition comprises~~ from about 0.05% to about 30% ~~of cobalt~~ by weight of the total catalyst composition including the support.

Claim 33 (currently amended): The catalyst composition of claim 13 ~~claim 29~~ wherein the metal in said third metal component is cobalt present in the amount of ~~and the catalyst composition comprises~~ from about 0.1% to about 25% ~~of cobalt~~ by weight of the total catalyst composition including the support.

Claim 34 (currently amended): The catalyst composition of claim 13 ~~claim 29~~ wherein the metal in said third metal component is ruthenium present in the amount of ~~and the catalyst composition comprises~~ from about 0.05% to about 10% ~~of ruthenium metal~~ by weight of the total catalyst composition including the support.

Claim 35 (currently amended): The catalyst composition of claim 13 ~~claim 29~~ wherein the metal in said third metal component is ruthenium present in the amount of ~~and the catalyst composition comprises~~ from about 0.1% to about 5% ~~of ruthenium metal~~ by weight of the total catalyst composition including the support.

Claim 36 (currently amended): A method of making a catalyst composition according to claim 13, the method comprising:

(a) applying a rhodium compound to a surface layer of a support having a depth of not more than 300 microns;

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(b) applying an indium compound to a surface layer of the support having a depth of not more than 300 microns; and optionally

(c) applying a compound of a third metal selected from the group consisting of iron, cobalt, and ruthenium ~~different from rhodium and from indium and selected from Groups 1 to 15 of the Periodic Table of Elements~~ to the support.

Claim 37 (previously presented): The method of claim 36 wherein said third metal compound is applied to the support before either the rhodium compound or the indium compound.

Claim 38 (previously presented): The method of claim 36 wherein the indium compound is applied to the support either concurrently with or before the rhodium compound.

Claim 39 (Original): The method of claim 36 wherein at least one of (a), (b) and (c) is effected by an impregnation, precipitation, slurry mixing or coating step.

Claim 40-43 (Cancelled)

Claim 44 (Original): The method of claim 36 and, after (a) and/or (b) and/or (c), calcining the support at a temperature of about 100°C to about 600°C.

Claim 45 (Original): The method of claim 36 and, after (a), (b) and (c), treating the calcined support in a reducing atmosphere at a temperature in excess of 200°C.

Claim 46 (Withdrawn): A process for selectively removing alkynes or diolefins from a feedstock also containing olefins, the process comprising contacting the feedstock with hydrogen in the presence of a catalyst composition made by the method of claim 36.

Claim 47 (Withdrawn): A process for selectively removing alkynes or diolefins from a feedstock also containing olefins, the process comprising contacting the feedstock with hydrogen in the presence of a catalyst composition as claimed in claim 1.

Claim 48 (Withdrawn): The process of claim 47 wherein the alkynes or diolefins have 2 to 4 carbon atoms and the feedstock also contains C₂ to C₄ olefins.

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Claim 49 (Withdrawn): The process of claim 47 wherein said contacting is conducted at a temperature of from about 20°C to about 150°C, a pressure of from about 690 kPa to 4100 kPa, and a molar ratio of hydrogen to alkynes and diolefins of from about 1 to about 1000.

Claim 50 (Withdrawn): The process of claim 47 wherein said contacting is conducted at a temperature of from about 30°C to about 100°C, a pressure of from about 1400 kPa to 3400 kPa, and a molar ratio of hydrogen to alkynes and diolefins of from about 1.1 to about 800.

Claim 51 (cancelled)

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Support for the Amendment

Claim 13 now provides for a catalyst consisting of the two embodiments set forth in the specification, e.g., paragraphs [0016] and [0019]. That the (optional) third metal component may have a metal selected from iron, cobalt, and ruthenium finds support in paragraph [0039] and original Claim 29. Note that the definition of "component" includes the elemental metal and/or a compound of said metal, as set forth in paragraphs [0031] and [0043]. Claim 17 has also been incorporated into Claim 13. Claim 13 is further amended in the preamble to use the language "consisting of", which takes its well-accepted meaning. The remainder of the amendments are believed to be strictly editorial in nature and/or to conform to the new language in Claim 13 concerning "consisting of".

It is believed that there is no possibility of new matter.